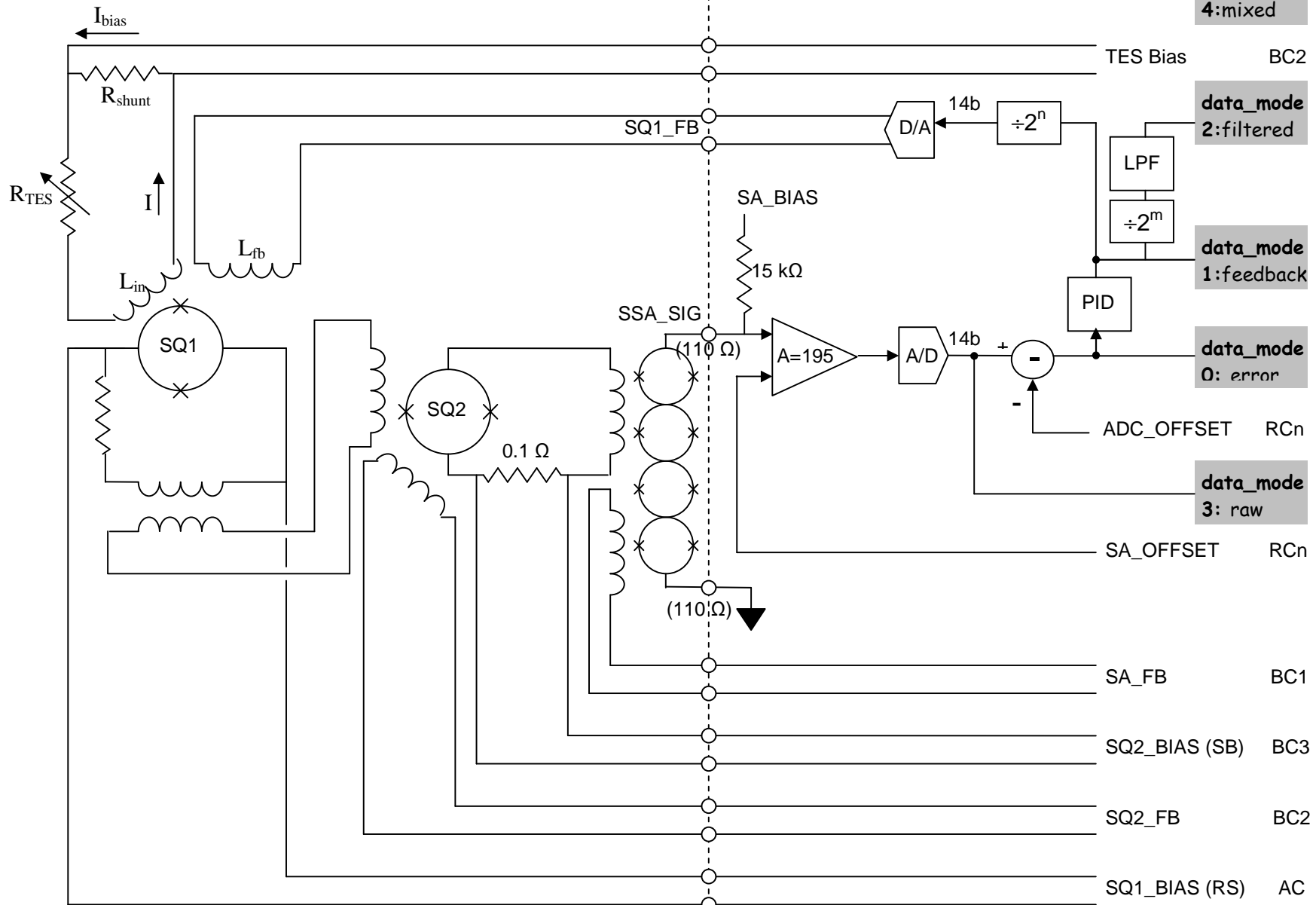


Cold Electronics

Warm Electronics  
(MCE)



**Servo mode:**  
 0: const 1: const 2: ramp 3: PID servo

**data mode:**  
 0: error 1: pre-scale feedback 2: filtered fb 3: raw  
 4: 18b fb + 14b er 5: 24b fb+ 8b flux\_cnt 7: 22b filtered fb + 10b er  
 9: 24b filtered fb + 8b flux\_cnt

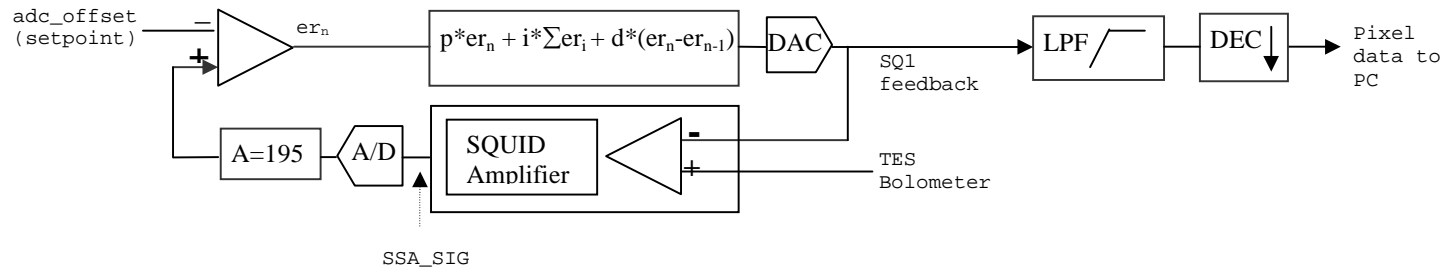
## *The SQUID Readout Servo Loop*

A gain of the preamp chain on readout-card

SSA\_SIG Series-array Signal from the cryostat,  
 $SSA\_SIG = a \cdot \cos((d+z) / 2\pi) + \text{offset1}$  where

$z$  is the phase-shift introduced by trapped flux  
 $\text{offset1}$  is the overall shift of output from zero

LPF Low-pass filter with  $f_{3dB} = 100\text{Hz}$  when  $f_s = 12195$  ( $50\text{MHz}/(\text{row\_len} \cdot \text{num\_rows}) = 50\text{MHz}/(100 \cdot 41)$ )



## *MCE internal scaling factors*

When `servo_mode = 3` or PID calculation is activated, calculation result for feedback is internally stored as a 64b word. The following diagram shows different windowing parameters of the 64b result.

